

### REMARKS

New claim 20 has been added. Thus, claims 1-20 are presented for examination. Support for new claim 20 may be found in original claims 1 and 2. Thus, no new matter has been added. Reconsideration and withdrawal of the present rejections in view of the comments presented herein are respectfully requested.

#### Obviousness-type double patenting

Claims 1-5, 8-13 and 16-19 were provisionally rejected on the ground of nonstatutory obviousness-type double patenting as allegedly being unpatentable over claims 1, 3-5 and 7 of copending Application No. 11/572,630. Applicants respectfully request that this rejection be held in abeyance until either the present application or the copending application is found to be allowable.

#### Prior art rejections

##### **A. Kawabe et al. (US 5,707,776)**

Claims 1, 3, 5, 8, 9, 11, 13 and 16-19 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Kawabe et al. (US 5,707,776), and Claims 1, 2, 4, 10 and 12 were rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Kawabe et al. (US 5,707,776). However, the claimed invention can be patentably distinguished from the Kawabe et al. reference for the reasons discussed below.

##### **1. *Claim 1- 5, 16 and 17***

Present claim 1 recites that a base material of a low molecular weight compound (X1), in which all or a portion the polyhydric phenol compound (x) is protected with acid dissociable, dissolution inhibiting groups. Claim 1 further recites that the proportion of this compound (XI) within the base material is greater than 80% by weight. Accordingly, only a very small proportion of the base material (<20%) comprises a material other than compound (XI).

In contrast, Kawabe et al. discloses that the content of the compounds having groups capable of being decomposed by acids (i.e. low molecular compounds and resins) is preferably from 1 to 100 parts by weight, more preferably from 3 to 50 parts by weight, per 100 parts by weight of the polymers in the resin composition (see column 41, lines 24-30). Thus, Kawabe et

al. fails to disclose the range of protected form of the compound recited in Claim 1. In addition, Kawabe et al. does not disclose the specific range of molecular weight dispersity as recited in present claim 1. As such, the Kawabe et al. reference does not anticipate Claim 1. For the same reasons, claims 2-5, 16 and 17 which depend on claim 1, cannot be anticipated by this reference.

Moreover, this difference in the amount of material protected with acid dissociable, dissolution inhibiting groups between the claimed invention and Kawabe et al. represents a nonobvious distinction over the prior art. In the base material recited in present claim 1, a low molecular weight polyhydric phenol compound is used as a main component instead of a resin. This base material makes the composition useful as a positive resist composition for a pattern-forming material, and provides a method of resist pattern formation that is capable of forming a high resolution pattern with reduced levels of line edge roughness (LER) (see paragraph [0005]).

In contrast, Kawabe et al. discloses a resist which is effective for producing semiconductor integration circuits by ultraviolet or far-ultraviolet lithography. In other words, the resist of Kawabe et al. is a radiation-sensitive resin composition having high resolution, high dry-etching resistance and high heat resistance for forming patterns with good profiles (column 4, lines 22-27). One having ordinary skill in the art would have no reason to modify the composition of Kawabe et al. to create the presently claimed invention, in which only a relatively small proportion of the material is a material, such as a base material resin, other than the material having phenolic hydroxyl groups protected with acid dissociable, dissolution inhibiting groups. Such a material would be of no use in connection with the materials described by Kawabe because it would no longer have the advantageous properties obtained in connection with the radiation-sensitive resin composition discussed by Kawabe et al.

Claim 1 and the claims dependent thereon are further nonobvious in light of the unexpected results achieved. As described above, the claimed invention provides a high resolution pattern with reduced levels of line edge roughness (LER) when used in connection with a positive photoresist composition. The composition described by Kawabe et al. could in no way be used for such purpose and is therefore incapable of achieving these unexpected results. These unexpected results are strong evidence of claim 1 and the claims dependent thereon.

## 2. Claims 8-13, 18 and 19

Present claim 8 recites a protected material (Y1), which is formed from a polyhydric phenol compound (y) that comprises two or more phenolic hydroxyl groups and has a molecular weight within a range from 450 to 1,500, in which either a portion of, or all of, said phenolic hydroxyl groups is protected with acid dissociable, dissolution inhibiting groups. Claim 8 further recites that the proportion within said base material of the protected material (Y1) is greater than 80% by weight (i.e. 20% or less is unprotected).

In contrast to the greater than 80% protected groups recited in Claim 8, the proportion of the protected material within the low molecular compounds having acid dissociable, dissolution inhibiting groups is disclosed by Kawabe et al. to be "from 0.01 to 0.5, preferably from 0.01 to 0.3, more preferably from 0.01 to 0.15." Kawabe et al. at Column 41, Lines 2-4. Thus, Kawabe discloses that not greater than 50% by weight of the material is protected. Accordingly, neither claim 8, nor claims 9, 11, 13, 18 and 19, which depend from claim 8, cannot be anticipated by this reference.

In addition, none of these claims are obvious over Kawabe et al. because Kawabe et al. expressly teaches away from the claimed proportion of protected material. MPEP § 2141.02 (VI) states that a "prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W. L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984)." Kawabe et al. discloses that if the proportion of protected groups is ">0.5, the resist film containing the resin is shrunk after PEB (post-exposure baking), or the resist film is adhered insufficiently to the substrate, or the resist film gives scum after development." Kawabe et al. at Column 41, lines 4-7. Thus, Kawabe concludes that "such is unfavorable." Column 41, lines 7-8. Accordingly, Kawabe et al. expressly teaches away from the presently claimed invention in which the proportion of protected groups is 80% or greater. For this reason, neither Claim 8 nor claims 9, 11, 13, 18 and 19, which depend thereon, can be obvious over Kawabe et al.

Claim 8 and the claims dependent thereon are further nonobvious in light of the unexpected results achieved. As described above, the claimed invention provides a high resolution pattern with reduced levels of line edge roughness (LER) when used in connection with a positive photoresist composition. The composition described by Kawabe et al. could in no

way be used for such purpose and is therefore incapable of achieving these unexpected results. These unexpected results are strong evidence of claim 1 and the claims dependent thereon.

In view of the comments presented above, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. § 102 (b) and 35 U.S.C. § 103 (a) over Kawabe et al.

**B. Tan et al. (US 6,638,683)**

Claims 1-19 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Tan et al. (US 6,638,683). Tan et al. discloses that a nonpolymeric dissolution inhibitor compound inhibits the dissolution of the alkali-soluble resin in an alkali, but upon exposure to light it functions to accelerate the dissolution of the resin in an alkali because the protective acid-decomposable groups thereof are eliminated by an acid generated upon exposure (see column 22, lines 20-26). The nonpolymeric dissolution inhibitor compound is equivalent to the low molecular weight compound (X1) which is protected with acid dissociable, dissolution inhibiting groups recited in the present claims.

Tan et al. differs from the presently claimed invention in substantially the same manner as the Kawabe et al. reference discussed above. With respect to claim 1 and its dependent claims, Tan et al. discloses that the proportion of the non-polymer dissolution inhibitor compound within the total amount of all solid components of the photosensitive composition is added from 3 to 50% by weight, preferably from 5 to 35% by weight (see column 42, lines 45-50). Thus, Tan et al. teaches no more than 50% by weight of low molecular weight compound.

In contrast, present claim 1 recites that the proportion of the compound (X1) within the base material is greater than 80% by weight, which is outside the range disclosed in Tan et al. However, Tan et al. specifically teaches away from this range. Tan et al. discloses that if the proportion exceeds 50%, there is a tendency that the storage stability is deteriorated to cause film shrinkage and the heat resistance of the resist is deteriorated (see column 42, lines 51-54). In view of this teaching away, Tan et al. cannot render Claim 1 and its dependent claims obvious.

Similarly, with respect to Claim 8 and its dependent claims, Tan et al. teaches that from 10 to 80% of the phenolic hydroxyl groups are protected. *See*, col. 3, lines 4-6 of Tan et al. In contrast, as previously described, present claim 8 recites that the proportion of the protected

material (Y1) within the base material is greater than 80% by weight, which is also outside the range disclosed in Tan et al. Tan et al. also expressly teaches away from the range claimed in Claim 8. Specifically, Tang et al. teaches that "If the degree of that replacement [of the phenolic hydroxyl groups with substituents] exceeds 80%, especially heat resistance decreases. Thus, such too high and too low degrees of replacement are unsuitable for the present invention." In view of this express teaching away, Claim 8 and its dependent claims cannot be obvious over this reference.

Moreover, Tan et al. neither discloses nor suggests the reduced level of LER which results from the presently claimed base material. These unexpected results further evidence the nonobviousness of the claimed invention.

In view of the comments presented above, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. §103(a).

#### CONCLUSION

Applicants submit that all claims are in condition for allowance. However, if minor matters remain, the Examiner is invited to contact the undersigned at the telephone number provided below. If any additional fees are required, please charge these to Deposit Account No. 11-1410. Should there be any questions concerning this application, the Examiner is respectfully invited to contact the undersigned at the telephone number appearing below.

Respectfully submitted,

KNOBBE, MARTENS, OLSON & BEAR, LLP

Dated: 12/17/09

By: 

Neil S. Bartfeld, Ph.D.  
Registration No. 39,901  
Agent of Record  
Customer No. 20,995  
(619) 235-8550

8202105  
120309